

CLAIMS

The invention claimed is:

1. An integral and removable packing unit, comprising:

5 a housing for removably holding a sacrificial packing material configured to form a steam seal between a sootblower steam tube and lance spindle when the packing unit is installed in an operative position in association with the steam tube and the spindle and the packing material is loaded by applying compression to the packing material; and

10 the housing holding the packing material forming an integral unit for installation to and removal from the operative position with the packing material intact.

2. The packing unit of claim 1, further comprising a compression unit for compressing the packing material to tighten the seal between steam tube and lance 15 spindle when the packing unit is installed in the operative position.

3. The packing unit of claim 1, further comprising a detent mechanism for unloading the packing material to facilitate installing the packing unit on, and removing the packing unit from, the operative position.

20 4. The packing unit of claim 3, wherein the compression unit comprises one or more coil springs located between first and second compression plates.

5. The packing unit of claim 4, wherein:
25 the packing unit defines a cylindrical opening for receiving the steam tube, and
the packing material comprises a series of equally-sized, concentric, sacrificial
packing rings having an inner dimension approximately equal to an outer dimension
of the steam tube and an outer dimension approximately equal to an inner dimension
of the housing.

30 6. The packing unit of claim 5, wherein the compression unit comprises a plurality of coil springs located around the cylindrical opening.

7. The packing unit of claim 6, wherein the detent mechanism comprises
35 one or more set screws that threadably engage at least one of the compression plates
to compress the coil springs and thereby unload the packing material.

8. The packing unit of claim 1, further comprising a packing wear monitor.

9. The packing unit of claim 8, wherein:

the compression unit comprises one or more coil springs located between first and second compression plates; and

the packing wear monitor comprises a viewing port revealing the linear travel position of the second compression plate.

10. The packing unit of claim 3, wherein the packing material is captured on the steam tube and compressed by the compression unit when the packing unit is in the operative position and the detent mechanism is inactive.

11. The packing unit of claim 3, wherein the packing material is captured on the steam tube and compressed between an internal bushing and a plunger coupled to the second compression plate when the packing unit is in the operative position and the detent mechanism is inactive.

12. An integral and removable packing unit, comprising:

a housing configured to be removably installed in an operative position in association with a sootblower steam tube and lance spindle with the steam tube passing through a cylindrical opening defined by the packing unit; and

5 a plurality of concentric, equally-sized, sacrificial packing rings captured on the steam tube and configured to form a steam seal between the spindle and the steam tube when the packing unit is installed in an operative position and the packing material is loaded by the compression unit.

10 13. The packing unit of claim 12, further comprising a compression unit coupled to the housing.

14. The packing unit of claim 13, further comprising a detent mechanism for unloading the packing material to facilitate installing the packing unit on, and
15 removing the packing unit from, the operative position.

15. The packing unit of claim 14, wherein the compression unit comprises one or more coil springs located between first and second compression plates.

20 16. The packing unit of claim 15, wherein the detent mechanism comprises one or more set screws that threadably engage at least one of the compression plates to compress the coil springs and thereby unload the packing material.

25 17. The packing unit of claim 16, further comprising a packing wear monitor including a viewing port revealing the linear travel position of the second compression plate.

18. A sootblower comprising:

a steam tube;

a lance tube telescopically received on the steam tube and having an associated lance spindle;

5 a housing for removably holding a sacrificial packing material configured to form a steam seal between the steam tube and the lance spindle when the packing unit is installed in an operative position and the packing material is loaded by applying compression to the packing material; and

the housing holding the packing material forming an integral unit for installation

10 to and removal from the operative position with the packing material intact.

19. The sootblower of claim 18, further comprising a compression unit for compressing the packing material to tighten the seal between steam tube and lance spindle when the packing unit is installed in the operative position.

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20. The sootblower of claim 19, further comprising a detent mechanism for unloading the packing material to facilitate installing the packing unit on, and removing the packing unit from, the operative position.

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21. The sootblower of claim 20, wherein the compression unit comprises one or more coil springs located between first and second compression plates.

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22. The sootblower of claim 19, wherein the detent mechanism comprises one or more set screws that threadably engage at least one of the compression plates to compress the coil springs and thereby unload the packing material.

23. The packing unit of claim 18, wherein the packing material is sacrificial, further comprising a packing wear monitor.

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24. The sootblower of claim 23, further comprising a packing wear monitor.

25. A sootblower comprising a lance tube telescopically received on a steam tube, the improvement comprising an integral packing housing containing a packing material that can be removed and reinstalled intact for the purpose of replacing the packing material.

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26. An industrial boiler comprising a cleaning system including a plurality of the sootblowers of claim 25.

27. A power plant having an output rating maintained by a boiler cleaning system comprising a plurality of the sootblowers of claim 25.

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28. A method for replacing a sootblower packing, comprising the steps of:
activating a detent mechanism to unload an integral packing housing and
packing material unit while the unit is installed in an operative position on the
sootblower;

5 removing the unit intact from the sootblower;
replacing the packing material;
reinstalling the unit in the operative position on the sootblower; and
deactivating the detent mechanism to load the packing material with the
compression unit.

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29. A method for maintaining a desired output rating for an industrial boiler
by continually cleaning the boiler with sootblowers while the boiler is in operation, and
periodically maintaining the sootblowers with packing replacement implemented
through step comprising, for each sootblower:

15 discontinuing boiler cleaning with the sootblower;
activating a detent mechanism to unload an integral packing housing packing
material unit while the unit is installed in an operative position on the sootblower;
removing the unit intact from the sootblower;
replacing the packing material;

20 reinstalling the unit in the operative position on the sootblower
deactivating the detent mechanism to cause the compression unit to load the
packing material; and
resuming boiler cleaning with the sootblower.